DF-150 Oxygen Analyzer

ONLY DELTA F NON-DEPLETING SENSORS PROVIDE THE FOLLOWING:

- Every analyzer is factory calibrated and *READY TO USE*.
- The non-depleting sensor *REQUIRES LITTLE OR NO RE-CALIBRATION* over time.
- Five year sensor warranty. *NO PERIODIC SENSOR REPLACEMENTS.*
- With the Stab-El™ option, *NO ACID SCRUBBING IS REQUIRED* for trace levels.

Every DF-150 is custom configured under ISO-9001 controls to your specification, calibrated to standards traceable to NIST and operated for several days to ensure flawless performance. You just take it out of the carton and start monitoring. Depending on the application, the ultra-stable sensor can operate for years without re-calibration. The only maintenance requirement is the occasional addition of distilled water, and a water level alarm is included.

For more information about the Delta F sensor technology and the thousands of companies and applications that use Delta F oxygen analyzers, ask for the Delta F Difference Brochure.

DF-150 SPECIFICATIONS

Range
Ranges are available from 0- 10 ppm to 25%

Sample Gas Compatibility
STANDARD SENSOR All inert and passive gases including N_2, H_2, CO, freons, hydrocarbons, etc.
SENSOR WITH Stab-El™ OPTION Neutralizes trace contaminants including acids such as CO_2, H_2S, Cl_2, NO_X, SO_X, etc. (Consult Delta F for concentration limits)

Options
Oxygen Alarms	Flow Alarm
Stab-EL™ Acid Gas System	Three Range
CE Certification	Sample Pump
Analog and Digital Outputs	Remote Sensor
Classified Area Enclosures	

Accuracy
±2% Full Scale at constant temperature
(Except 5% full scale on ranges below 0-2.5 ppm)

Response Time
Responds instantaneously to O_2 change.
Equilibrium time depends on specific conditions. Typically less than 20 seconds to read 90% of a step change.

Sample Requirements
Gas phase, non-condensing, 0 to 150ºF.
Flow should be 1.0 to 3.0 SCFH at 0.2 to 1.0 psig pressure.

Misc.
19.7cmW X 21.6H X 25.4D 7kg. (7.75"W X 8.5"H X 10"D 15 lbs.)
Operate between 0º and 45º C ambient (32º and 120ºF)
115 VAC or 220 VAC at 25 Watts

Configuration and Installation

Delta F provides comprehensive assistance for a broad variety of application problems including measurements of semiconductor specialty gases. Depending on the model, Delta F analyzers can be configured to provide a wide choice of outputs for data collection and process control systems. Contact your Delta F representative for an Applications Data Sheet and pricing information.

THE DIFFERENCE
DELTA F

Delta F Corporation
4 Constitution Way
Woburn, MA 01801-1087
USA

Tel: (781) 935-4600
Fax: (781) 938-0531

e-mail: marketing@delta-f.com

THE DIFFERENCE
DELTA F

DF-150 Oxygen Analyzer
Standard Features & Specifications

Performance

Accuracy: (at constant conditions)   ±2% Full Scale
(Except 5% Full Scale on ranges below 0-2.5 ppm)

Response Time

Responds instantaneously to O_2 change.
(Equilibrium time depends on specific conditions. Typically less than 20 seconds to read 90% of a step change.)

Range   Ranges are available from 0-10 ppm to 25%

Ambient Operating Temperature

32º to 120º F (0º to 50º C)

Background Gas Compatibility

Standard Sensor:

All inert and passive gases including N_2, H_2, CO, freons, hydrocarbons, etc.

Sensor with Stab-EL Option:

Neutralizes trace contaminants including acids such as CO_2, H_2S, Cl_2, NO_X, SO_X, etc. (Consult Delta F for concentration limits)

Gas Sample Conditions

Sample Pressure

Operating limits:

0.2 to 1.0 psig (1.03 to 1.08 Bar) - Standard
2.0 psi vacuum to 0.2 psig (.88 to 1.03 Bar) use pump
1.0 to 10 psig (1.08 to 2.72 Bar) use valve or regulator
Above 10 psig (2.72 Bar) use regulator

Sensor overpressure damage limit: 10 psig (2.7 Bar)

Return Pressure: Atmospheric Vent (optimal)
Limits   +5 psig (1.36 Bar) to –5 psig (0.67 Bar)

Flow Rate: 1.0 to 3.0 SCFH (0.5 to 1.5 slpm)

Temperature (Gas Sample)   0º to 150º F (-17.8º to 66ºC)

Moisture: No limits (avoid condensation)

Oil/Solvent Mist: < 0.5 mg/ft3 (standard)
> 0.5 mg/ft3 – use filter

Solid Particles: < 2 mg/ft3 (standard)
> 2 mg/ft3 use filter

Gas Flow System

Construction Materials: 304 and 316 SS

Gas Connections: 1/8" compression tube fittings

Construction

Enclosure: NEMA 1

Weight: 15 lbs. (7 kg.)

Dimensions: 7.75" W x 8.5" H x 10" D
(19.7 cm W x 21.6 cm H x 25.4 cm D)

Electrical

Power Input   115 VAC, 50/60 Hz or
230 VAC, 50/60 Hz

Output Signals   0-10 VDC (standard),
OR 0-1, 0-2, 0-5 VDC (optional)
Isolated 4-20 mADC (optional)

Alarm, visual   Electrolyte Condition (standard)

Alarms, optional   Low Flow (relay contacts and visual),
Choice of two   Low Oxygen or High Oxygen
(adjustable set-point, relay contacts only)

Alarm Relay Rating   SPDT - 5 amps at 110 or 220 VAC
CE version: 3 Amps at 30 VDC
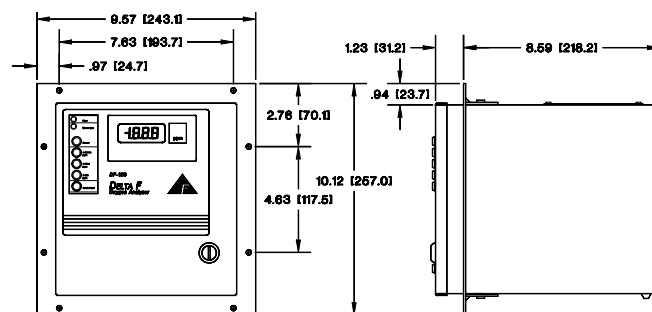Failsafe Action

Indicators, optional   Sensor Off, Remote Range,
Low Flow (contacts only)
No Failsafe Action

Indicator Contact Rating   SPST – 0.5 amps at 24 VDC
or SPTT - 0.5 amps at 24 VDC

Display: 3.5 Digit LCD
4.5 Digit LCD (range dependent)

Certifications: CSA (optional)
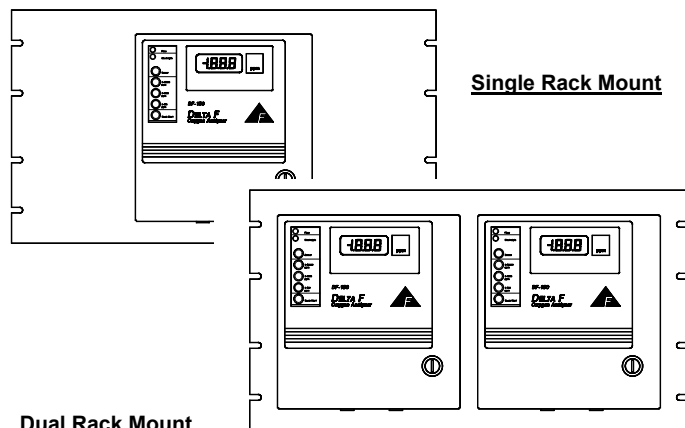CE Conformance (optional)

Panel Mount

19" Rack Mount
Height: 10.46" [26.57 cm]
Depth: Same as Panel Mount (above)

Single Rack Mount

Dual Rack Mount

DF-150 Oxygen Analyzer

Optional Equipment

Base Models

Single Range Analyzers

PPM Range	DF-150 Model
0 to 5,000	151-5000
1,000	151-1000
500	151-500
100	151-100
50	151-50
10	151-10

% Ranges	DF-150 Model
0 to 25%	151-P25
10%	151-P10
5%	151-P5
1%	151-P1

Three Range Analyzers

PPM Ranges	DF-150 Model
100/1,000/10,000	153-10000
50/500/5,000	153-5000
10/100/1,000	153-1000
5/50/500	153-500
1/10/100	153-100

% Ranges	DF-150 Model
0.25/2.5/25 %	153-P25
0.1/1/10 %	153-P10
0.05/0.5/5 %	153-P5

Options

Base Options

150-S *Stab-El Acid Gas System*

150-220 *220 VAC Line Voltage* (110 VAC is standard)

150-ETLC *CSA Equivalent Certification*

150-CE *CE Conformance*
Provides added EMI/RFI and conducted interference immunity

Remote   *NOTE 1 & Choose only 1 Remote option*

150-RPC *Remote Pump Control*
Enables front panel analyzer control of user supplied external pump.
Power Capacity: 5W @110 VAC (Remote Pump not included)

150-RCOBP *Remote Control of On Board Pump*
Permits control of on-board pump via external, user supplied, switch or
analyzer front panel. Switch Rating: 5W @110 VAC
(On-board pump, 150-P, must be ordered separately)

150-RS *Remote Sensor*
Remote sensor with flowmeter and mounting bracket

150-N4RS *NEMA 4 Remote Sensor*
Includes remote sensor and flowmeter mounted in a NEMA4 enclosure

150-N7RS *NEMA 7 Remote Sensor*
Includes remote sensor mounted in a NEMA7 housing with an external
flowmeter

150-RSH *Remote Sensor Heater*

Alarms   *Choose only 1 alarm option*

150-OAL *Oxygen Alarm – Low* (SPDT relay contacts)

150-OAH *Oxygen Alarm – High* (SPDT relay contacts)

150-FA *Low Flow Alarm* (SPDT relay and visual)

150-2OAL *Oxygen Alarms – Low-Low* (Two 150-OAL)

150-2OAH *Oxygen Alarms – High-High* (Two 150-OAH)

150-OALH *Oxygen Alarms – Low-High* (150-OAL & 150-OAH)

150-OAHF *High Oxygen &-Flow Alarm* (150-OAH & 150-FA)

150-OALF *Low Oxygen &-Flow Alarm* (150-OAL & 150-FA)

Indicators

150-SOI *Sensor Off Indication* (SPST contacts only)

150-RRI *Remote Range Indication* (SPTT contacts only)

150-LFI *Low Flow Indicator* (SPST contacts only) [NOTE 1]

Cabinet

150-PM *Panel Mount*

150-SRM *Single Rack Mount*

150-DRM *Double Rack Mount*

Plumbing

150-P *Pump with Down Stream Control Valve*
Diaphragm pump for negative pressures to 2.0 psi vacuum (0.88 Bar),
or outlet vent back pressure to 3.0 psig (1.2 Bar)

150-GPR *Gauge Pressure Regulator*
Out-board 316 Stainless Steel Pressure Regulator, 3000 psig (208 Bar)
inlet capacity; 0-10 psig (2.7 Bar) adjustable outlet pressure. Requires
5 psig (1.36 Bar) minimum inlet pressure

150-APR *Absolute Pressure Regulator*
Vacuum to 500 psig (35.5 Bar) inlet capacity; 4 psia to 25 psia (-10 to
+10 psig) (0.32 Bar to 2.7 Bar) adjustable outlet pressure

150-FCV *Flow Control Valve*
Up stream control for pressures less than 10 psig (2.7 Bar)

150-SSOL *Stainless Steel Outlet Line* [NOTE 2]

150-FH *Filter Housing*
(Includes Standard Filter Element, SFE)

Outputs   *Choose 1 only of 150-SAOA, B, or C*

150-SAOA *Special Analog Output 0 to 1 VDC*

150-SAOB *Special Analog Output 0 to 2 VDC*

150-SAOC *Special Analog Output 0 to 5 VDC*

150-420 *4 to 20 mA Isolated Output*

Miscellaneous

150-QS *Quick Start*
Produces a quicker equilibrium at low ppm levels

150-GSF *Gas Scale Factor*
Permits meter read-out of O_2 in background gases having significantly
different diffusivities compared to nitrogen, such as, He, H_2, or C_3 and
heavier hydrocarbons

150-SST *Stainless Steel Tag*

150-RSC *Remote Sensor Cable*

SFE *Standard Filter Element* (particle size >1 micron)

FFE *Fine Filter Element* (particle size <1 micron)

EO5 *Electrolyte*

Notes:
1. Not Available with CE Certified Analyzers
2. Suggested for flammable gases. Not available with on-
   board pump, 150-P.